

Pathogenesis of Asthma in Children



Inflammation in asthma contributes to:

- Airway hyperresponsiveness
- Airflow limitation
- Respiratory symptoms (coughing, wheezing, shortness of breath or rapid breathing, chest tightness)
- Persistent symptoms
- Pathologic damage, even when symptoms are not present

Components of Airflow Limitation

- Acute bronchoconstriction
- Airway edema
- Mucus plug formation
- Airway injury and repair

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Asthma, whatever the severity, is a chronic, inflammatory disorder of the airways.

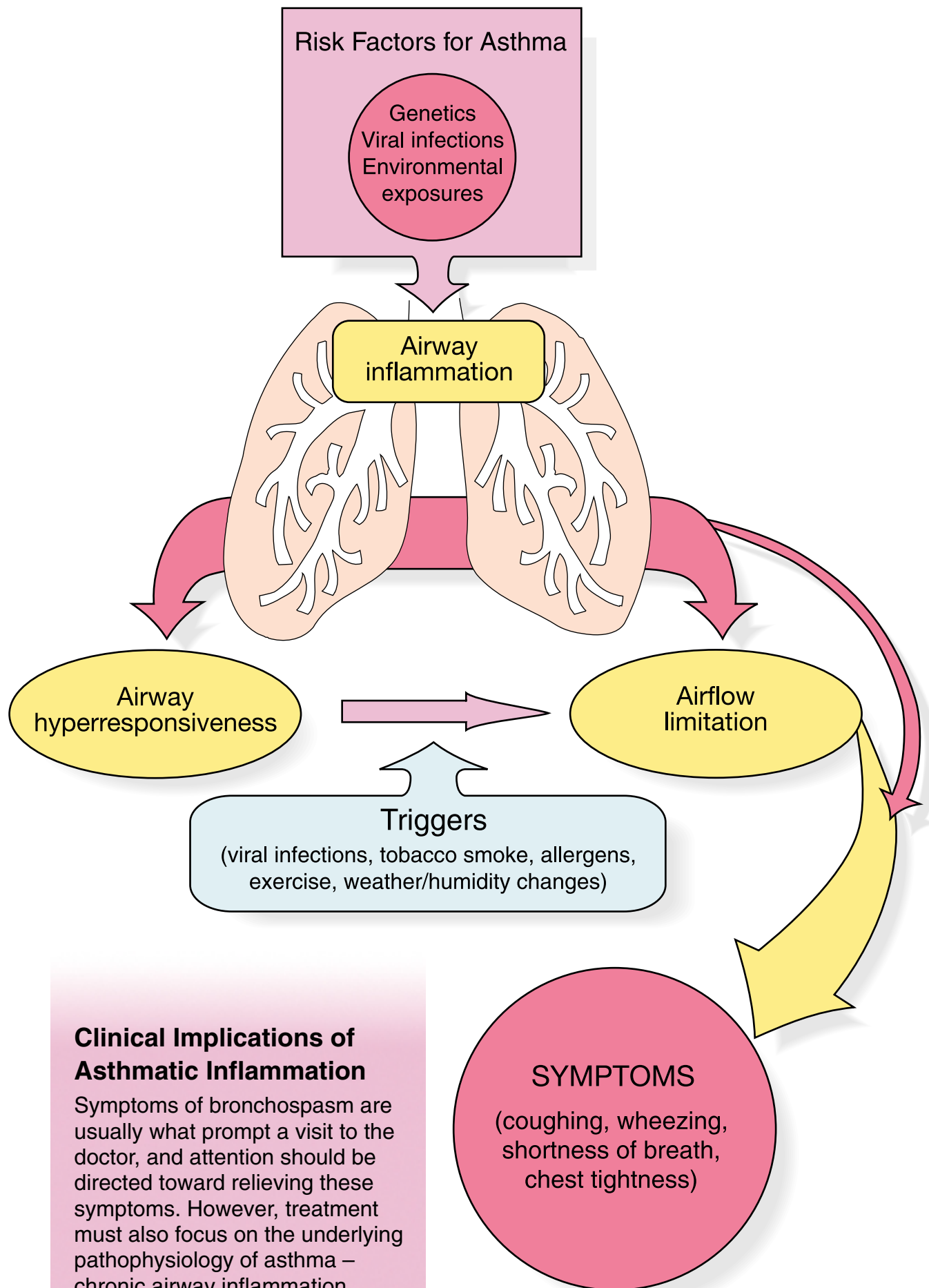
The characteristic features of asthmatic inflammation are:

- Mast cell activation
- Inflammatory cell infiltration
 - ⇒ eosinophils
 - ⇒ airway macrophages
 - ⇒ neutrophils (particularly in sudden-onset, fatal exacerbations)
 - ⇒ lymphocytes (TH₂-like cells)
- Edema
- Denudation and disruption of the bronchial epithelium
- Collagen deposition beneath basement membrane
- Goblet cell hyperplasia
 - ⇒ mucus hypersecretion
- Smooth muscle thickening

These features underscore the importance of chronic inflammation in asthma and its effects on the airway. Moreover, these morphologic changes may not be completely reversible, and may contribute to remodeling of the airways.

Inflammation in Childhood Asthma

- MOST studies of inflammation in asthma have been conducted in adults, but studies in children with diagnosed asthma show similar findings.
- In infants and young children who wheeze with acute viral upper respiratory infections, the relative contributions of airway inflammation, bronchial smooth muscle abnormalities, and/or other structural factors in producing wheeze are not clear. However, anti-inflammatory treatment for these children can reduce morbidity from wheezing in early childhood.



Clinical Implications of Asthmatic Inflammation

Symptoms of bronchospasm are usually what prompt a visit to the doctor, and attention should be directed toward relieving these symptoms. However, treatment must also focus on the underlying pathophysiology of asthma – chronic airway inflammation. Treatment of inflammation will prevent episodic symptoms.

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